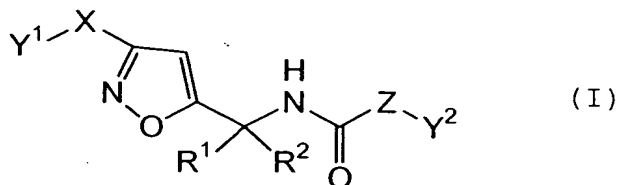


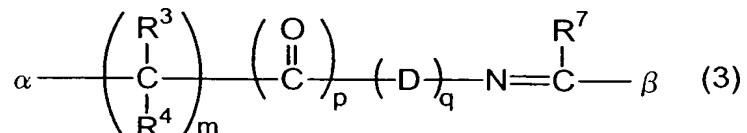
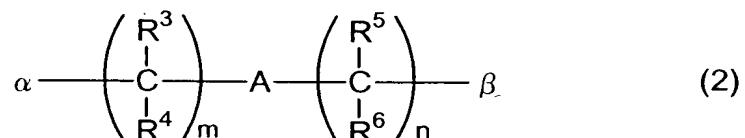
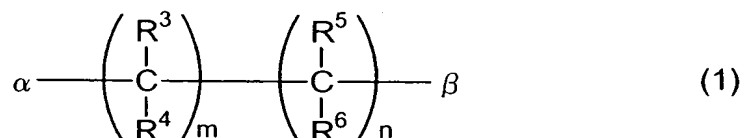
# CLAIMS

1. A substituted isoxazole alkylamine derivative represented by the formula (I):



5 wherein  $R^1$  and  $R^2$  may be the same or different, and each represent a hydrogen atom, a lower alkyl group which may be substituted, a lower alkenyl group, a lower alkynyl group, a cycloalkyl group which may be substituted, a lower alkoxy group, a lower alkoxycarbonyl group, a lower alkylthio group,  
 10 a halogen atom, a hydroxyl group, a carboxyl group, or a cyano group, or  $R^1$  and  $R^2$  may together form a cycloalkyl group which may be substituted;

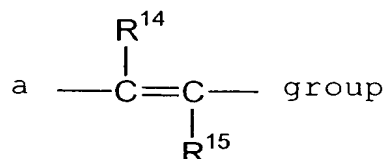
X represents the following formula (1), (2), or (3):



15 wherein  $R^3$ ,  $R^4$ ,  $R^5$ , and  $R^6$  may be the same or different, and each represent a hydrogen atom, a lower alkyl group which

may be substituted, a lower alkenyl group, a lower alkynyl group, a cycloalkyl group which may be substituted, a lower alkoxy group, a lower alkoxy carbonyl group, a lower alkylthio group, an amino group, a lower alkylamino group, a di(lower alkyl)amino group, a halogen atom, a hydroxyl group, or a cyano group, or each pair of  $R^3$  and  $R^4$ , and  $R^5$  and  $R^6$  may together form a cycloalkyl group which may be substituted;

A represents an oxygen atom, a sulfur atom, an  $-S(O)-$  group, an  $-S(O)_2-$  group, an  $-NR^{12}-$  group wherein  $R^{12}$  represents a hydrogen atom or a lower alkyl group, a carbonyl group, an  $-NH-CO-$  group, a  $-CO-NH-$  group, a  $-C\equiv C-$  group, an  $-NH-CO-NH-$  group, an  $-O-CONH-$  group, an  $-HC=N-$  group, or



wherein  $R^{14}$  and  $R^{15}$  each represent a hydrogen atom or a lower alkyl group;

m and n each represent 0 or an integer of 1 to 3;

p and q each represent 0 or 1;

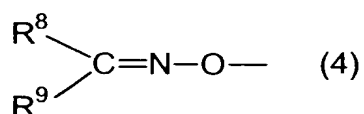
$R^7$  represents a hydrogen atom or a lower alkyl group; and

D represents an oxygen atom or an  $-NH-$  group;

a binds to a  $Y^1$  side, and  $\beta$  binds to an isoxazole moiety);

$Y^1$  represents a lower alkyl group which may be substituted, a lower alkenyl group which may be substituted,

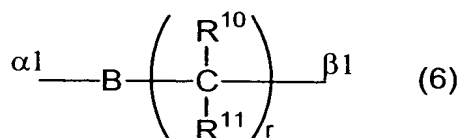
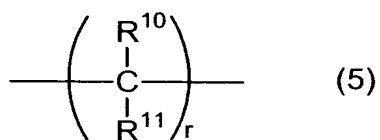
a lower alkynyl group which may be substituted, a cycloalkyl group which may be substituted, a lower cyclo alkenyl group which may be substituted, a phenyl group which may be substituted, a naphthyl group which may be substituted, a heteroaryl group which may be substituted, an aliphatic hetero ring which may be substituted, or the following formula (4):



wherein  $\text{R}^8$  and  $\text{R}^9$  each represent a hydrogen atom, a lower alkyl group which may be substituted, or a phenyl group which may be substituted, or  $\text{R}^8$  and  $\text{R}^9$  may together form a cycloalkyl group which may be substituted;

$\text{Y}^2$  represents a lower alkenyl group which may be substituted, a lower alkynyl group which may be substituted, a cycloalkyl group which may be substituted, a lower cyclo alkenyl group which may be substituted, a phenyl group which may be substituted, a naphthyl group which may be substituted, a heteroaryl group which may be substituted, or an aliphatic hetero ring which may be substituted;

$\text{Z}$  represents a group denoted by the following formula (5) or (6):



wherein  $R^{10}$  and  $R^{11}$  may be the same or different, and each represent a hydrogen atom, a lower alkyl group which may be substituted, a cycloalkyl group which may be substituted, a lower alkoxy group, a lower alkoxycarbonyl group, a lower alkylthio group, an amino group, a lower alkylamino group, a di(lower alkyl)amino group, a halogen atom, a hydroxyl group, or a cyano group, or  $R^{10}$  and  $R^{11}$  may together form a cycloalkyl group which may be substituted;

r represents 0 or an integer of 1 to 3; and

10 B represents an oxygen atom, a sulfur atom, or an  $-NR^{13}-$  group wherein  $R^{13}$  represents a hydrogen atom or a lower alkyl group;

any one of  $\alpha 1$  and  $\beta 1$  may be bound to a  $Y^2$  side;

provided that the following (1) to (3) are excluded:

15 (1) a compound in which X is a single bond (i.e. the case that each of m and n is 0 in the formula (1)) and  $Y^1$  represents a 4-hydroxy-3,5-di-tert-butylphenyl group;

(2) a compound in which  $R^1$  and  $R^2$  represent hydrogen atoms, X is a single bond (i.e. the case that each of m and n is 0 in the formula (1)) and both  $Y^1$  and  $Y^2$  represent unsubstituted phenyl groups (2-1) when Z is a single bond (i.e. the case that r is 0 in the formula (5)) or (2-2) when Z is an NH group (i.e. the case that  $r=0$  and B represents an  $-NH-$  group in the formula (6)); and

25 (3) a compound in which  $R^1$  and  $R^2$  represent hydrogen atoms, Z

is a single bond (i.e. the case that  $r$  is 0 in the formula (5)) and  $Y^2$  represents a 4-hydroxycinnolin-3-yl group which may be substituted.

5           2.     The substituted isoxazole alkylamine derivative according to claim 1, wherein  $R^1$  and  $R^2$  each independently represent a hydrogen atom or a lower alkyl group which may be substituted.

10           3.     The substituted isoxazole alkylamine derivative according to claim 2, wherein  $Z$  is an oxygen atom (i.e. the case that  $r$  is 0 and  $B$  is an oxygen atom in the formula (6)), and  $Y^2$  represents a phenyl group which may be substituted, a naphthyl group which may be substituted, or a cycloalkyl  
15 group which may be substituted.

          4.     The substituted isoxazole alkylamine derivative according to claim 2, wherein  $Z$  represents an  $-NR^{13}-$  group wherein  $R^{13}$  represents a hydrogen atom or a lower alkyl group  
20 (i.e. the case that  $r$  is 0 and  $B$  is an  $-NR^{13}-$  group) and  $Y^2$  represents a phenyl group which may be substituted, a naphthyl group which may be substituted, or a cycloalkyl group which may be substituted.

25           5.     The substituted isoxazole alkylamine derivative

according to claim 2, wherein X and Z are single bonds (i.e. the case that m and n are 0 in the formula (1) and r is 0 in the formula (5)) and Y<sup>2</sup> represents a phenyl group which may be substituted, a naphthyl group which may be substituted,  
5 or a cycloalkyl group which may be substituted.

6. The substituted isoxazole alkylamine derivative according to claim 2, wherein X represents a group represented by the formula (1) wherein R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> may  
10 be the same or different and each represent a hydrogen atom, a lower alkyl group which may be substituted, a lower alkoxy group, a lower alkoxy carbonyl group, a halogen atom, or a cyano group, Y<sup>2</sup> represents a phenyl group which may be substituted, a naphthyl group which may be substituted, or a  
15 cycloalkyl group which may be substituted, and m + n is 1, 2, or 3.

7. The substituted isoxazole alkylamine derivative according to claim 2, wherein X represents a group  
20 represented by the formula (2) wherein R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> may be the same or different and each represent a hydrogen atom, a lower alkyl group which may be substituted, a lower alkoxy group, a lower alkoxy carbonyl group, a halogen atom, or a cyano group, Y<sup>2</sup> represents a phenyl group which may be  
25 substituted, a naphthyl group which may be substituted, or a

cycloalkyl group which may be substituted, n is 1 or 2, and m + n is 1, 2, or 3.

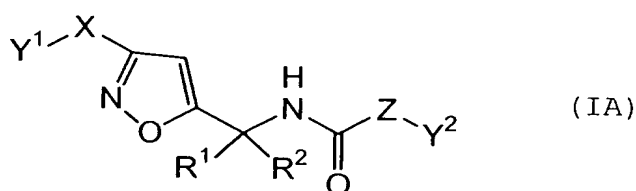
8. The substituted isoxazole alkylamine derivative  
5 according to claim 2, wherein X represents a group represented by the formula (2) wherein R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> may be the same or different and each represent a hydrogen atom, a lower alkyl group which may be substituted, a lower alkoxy group, a lower alkoxycarbonyl group, a halogen atom, or a  
10 cyano group, Y<sup>2</sup> represents a phenyl group which may be substituted, a naphthyl group which may be substituted, or a cycloalkyl group which may be substituted, n is 0, and m is 0, 1, or 2.

15 9. The substituted isoxazole alkylamine derivative according to claim 2, wherein X represents a group represented by the formula (3) wherein R<sup>3</sup> and R<sup>4</sup> may be the same or different and each represent a hydrogen atom, a lower alkyl group which may be substituted, a lower alkoxy  
20 group, a halogen atom, or a cyano group, m represents 0, 1, or 2, and Y<sup>2</sup> represents a phenyl group which may be substituted, a naphthyl group which may be substituted, or a cycloalkyl group which may be substituted.

25 10. The substituted isoxazole alkylamine derivative

according to claim 2, wherein  $Y^1$  represents a methyl group substituted with a halogen atom, and Z is a single bond (i.e. the case that m and n are 0 in the formula (1)).

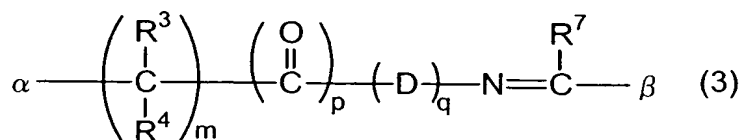
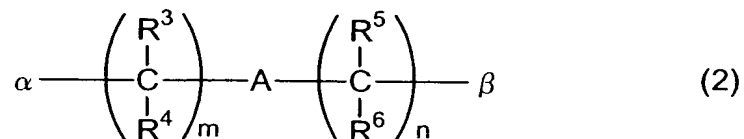
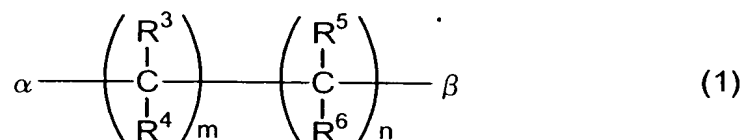
- 5            11. An agri-horticultural fungicide containing as an active ingredient a substituted isoxazole alkylamine derivative represented by the formula (IA):



wherein  $R^1$  and  $R^2$  may be the same or different, and each  
 10 represent a hydrogen atom, a lower alkyl group which may be substituted, a lower alkenyl group, a lower alkynyl group, a cycloalkyl group which may be substituted, a lower alkoxy group, a lower alkoxycarbonyl group, a lower alkylthio group, a halogen atom, a hydroxyl group, a carboxyl group, or a  
 15 cyano group, or  $R^1$  and  $R^2$  may together form a cycloalkyl group which may be substituted;

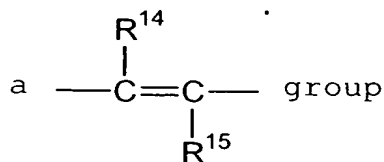
X represents the following formula (1), (2), or (3):





wherein  $R^3$ ,  $R^4$ ,  $R^5$ , and  $R^6$  may be the same or different, and each represent a hydrogen atom, a lower alkyl group which may be substituted, a lower alkenyl group, a lower alkynyl group, a cycloalkyl group which may be substituted, a lower alkoxy group, a lower alkoxycarbonyl group, a lower alkylthio group, an amino group, a lower alkylamino group, a di(lower alkyl)amino group, a halogen atom, a hydroxyl group, or a cyano group, or each pair of  $R^3$  and  $R^4$ , and  $R^5$  and  $R^6$  may together form a cycloalkyl group which may be substituted;

A represents an oxygen atom, a sulfur atom, an  $-S(O)-$  group, an  $-S(O)_2-$  group, an  $-NR^{12}-$  group wherein  $R^{12}$  represents a hydrogen atom or a lower alkyl group, a carbonyl group, an  $-NH-CO-$  group, a  $-CO-NH-$  group, a  $-C\equiv C-$  group, an  $-NH-CO-NH-$  group, an  $-O-CONH-$  group, an  $-HC=N-$  group, or



wherein  $\text{R}^{14}$  and  $\text{R}^{15}$  each represent a hydrogen atom or a lower alkyl group;

m and n each represent 0 or an integer of 1 to 3;

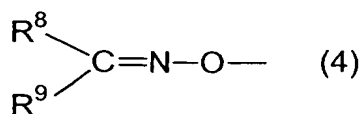
5 p and q each represent 0 or 1;

$\text{R}^7$  represents a hydrogen atom or a lower alkyl group; and

D represents an oxygen atom or an -NH- group;

a binds to a  $\text{Y}^1$  side, and  $\beta$  binds to an isoxazole moiety;

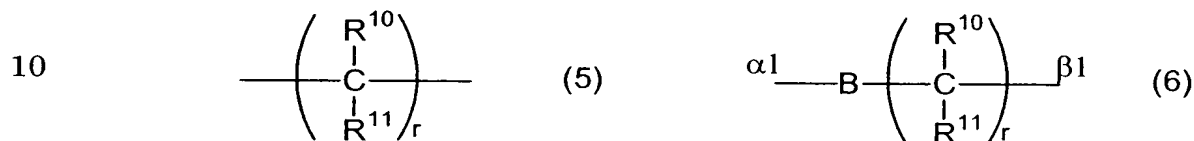
$\text{Y}^1$  represents a lower alkyl group which may be  
 10 substituted, a lower alkenyl group which may be substituted,  
 a lower alkynyl group which may be substituted, a cycloalkyl  
 group which may be substituted, a lower cyclo alkenyl group  
 which may be substituted, a phenyl group which may be  
 substituted, a naphthyl group which may be substituted, a  
 15 heteroaryl group which may be substituted, an aliphatic  
 hetero ring which may be substituted, or the following  
 formula (4):



wherein  $\text{R}^8$  and  $\text{R}^9$  each represent a hydrogen atom, a lower  
 20 alkyl group which may be substituted, or a phenyl group  
 which may be substituted, or  $\text{R}^8$  and  $\text{R}^9$  may together form a  
 cycloalkyl group which may be substituted;

Y<sup>2</sup> represents a lower alkenyl group which may be substituted, a lower alkynyl group which may be substituted, a cycloalkyl group which may be substituted, a lower cycloalkenyl group which may be substituted, a phenyl group which  
 5 may be substituted, a naphthyl group which may be substituted, a heteroaryl group which may be substituted, or an aliphatic hetero ring which may be substituted;

Z represents a group represented by the following formula (5) or (6):



wherein R<sup>10</sup> and R<sup>11</sup> may be the same or different, and each represent a hydrogen atom, a lower alkyl group which may be substituted, a cycloalkyl group which may be substituted, a lower alkoxy group, a lower alkoxycarbonyl group, a lower  
 15 alkylthio group, an amino group, a lower alkylamino group, a di(lower alkyl)amino group, a halogen atom, a hydroxyl group, or a cyano group, or R<sup>10</sup> and R<sup>11</sup> may together form a cycloalkyl group which may be substituted;

r represents 0 or an integer of 1 to 3; and

20 B represents an oxygen atom, a sulfur atom, or an -NR<sup>13</sup>- group wherein R<sup>13</sup> represents a hydrogen atom or a lower alkyl group;

any one of α1 and β1 may be bound to a Y<sup>2</sup> side.